Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Salem/Beverly Water Supply Board

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

PWS Name	Salem/Beverly Water Supply Board
PWS Address	Arlington Street
City/Town	Beverly, Massachusetts 01915
PWS ID Number	3030001
Local Contact	Thomas Knowlton
Phone Number	(978) 922-2521

Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

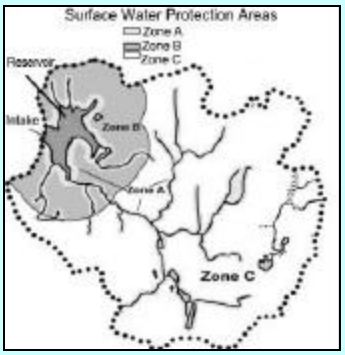
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Emergency Planning Recommendations for Class B River Intakes
4. Source Water Protection
5. Appendices

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Section 1: Description of the Water System

Surface Water Sources

Source Name	*Source ID #*	*Susceptibility*
Wenham Lake	3030001-01S	High
Longham Reservoir	3030001-02S	High
Putnamville Reservoir	3030001-03S	High
Ipswich River	3030001-04S	High

The Salem/Beverly Water Supply Board (Salem/Beverly) maintains and operates four public water supply sources. All of Salem/Beverly's water supplies are located within the Ipswich River basin. The reservoirs for Salem/Beverly are located within three separate water supply protection areas, with Wenham Lake (3030001-01S) being in Beverly and Wenham; Longham Reservoir (3030001-02S) is entirely in Wenham; and Putnamville Reservoir (3030001-03S) being entirely in Danvers. The intake for the Ipswich River (3030001-04S) is in Topsfield, with the canal being in Wenham.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at http://www.epa.gov/safewater/ccr1.html

Class B Drinking Water Sources

There are twelve Class B drinking water sources on rivers in Massachusetts, eleven in the urbanized northeast and one in the western part of the State. Three of these sources are located on the Ipswich River. The large watersheds and historically urbanized land uses associated with major rivers makes source protection a challenge at the Class B sources.

A Class B water body source such as the Ipswich River does not have Zone A, B and C protection areas, as do Class A water body sources. For the purposes of the SWAP assessments, a 400 foot setback area along the river and all feeder streams has been delineated for Class B water body sources that is referred to as an "Emergency Planning Zone". Land uses and activities within this zone are of particular concern for source protection and emergency planning because of their proximity to the water supply.

River drinking water sources are particularly susceptible to spills and accidental releases from public and private discharges; accidents related to vehicles, railroads, airports, boats; utility easements; fixed site releases at industrial and public facilities; inappropriate use of pesticides and fertilizers; improper disposal of hazardous household waste; and illegal dumping of a variety of substances.

This assessment has been conducted on the watershed area upstream of the Salem/Beverly intake. In addition, DEP has delineated a 400-foot emergency planning zone (shown on the GIS map that accompanies this report) adjacent to the river and its tributaries for the purpose of this assessment.

Glossary
Protection Zones

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

Section 2: Land Uses in the Protection Areas

The watersheds for the Salem/Beverly reservoirs and Ipswich River intake are primarily a mixture of forest and residential use, with a small portion consisting of agricultural, commercial, and industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone A and Emergency Planning Zone
2. Chemical and Hazardous Materials Manufacture, Storage and Use
3. Agricultural Activities
4. Residential Land Uses
5. Transportation Corridors
6. Road and Maintenance Depots
7. Oil or Hazardous Material Contamination Sites
8. Comprehensive Surface Water Protection Planning

The ranking of susceptibility to contamination for Wenham Lake, Longham Reservoir, Putnamville Reservoir, and the Ipswich River watersheds are high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Activities in Zone A and Emergency Planning Zone - A Zone A for a reservoir includes all areas within 400 feet of the reservoir shore line and within 200 feet of either side of all streams and feeder ponds that flow into the reservoir. The Emergency Planning Zone is a 400 foot setback on either side of the river and all tributaries to a Class B river intake. Land use activities within a Zone A or Emergency Planning Zone may have an impact on surface water sources. Existing and future land use activities which may have an impact on surface water sources include: on-site septic systems; public and private recreational activities; untreated stormwater runoff; domestic animals; new construction; spills along roads; above ground and underground storage tanks; erosion; and, un-permitted and unauthorized activities. Also, wild animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Class B River Intakes

Class B water sources do not have Zone A , B and C protection areas as the Class A sources do. For the purposes of this report, an "Emergency Planning Zone" has been delineated. The **Emergency Planning Zone** is the land area within 400 feet of both sides of the river including all tributary streams and surface water bodies.

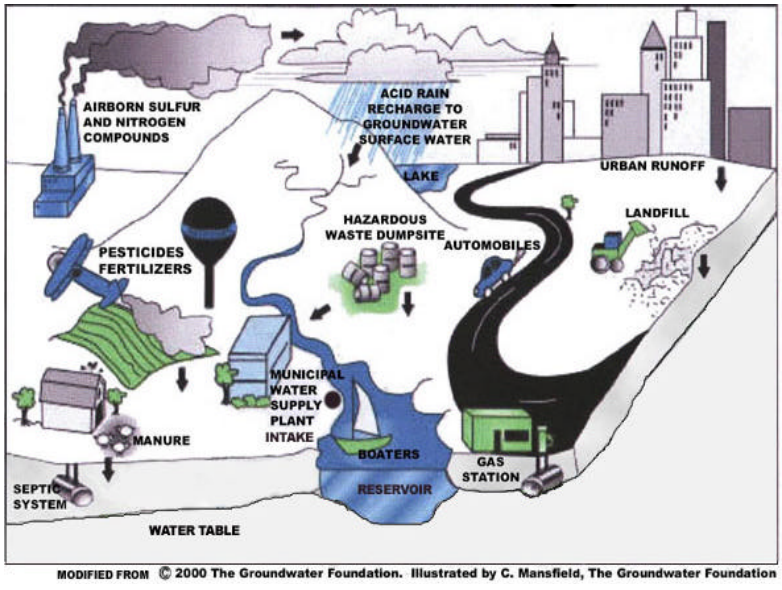


Figure 1: Sample watershed with examples of potential sources of contamination

Zone A Recommendations:

Work with communities within the combined watersheds to:

- ✓ To the extent possible, remove all activities from the Zone As to comply with DEP's Zone A requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials .
- ✓ Storage of pesticides, fertilizers or road salt within the Zone A and Emergency Planning Zone should be covered and contained.
- ✓ Keep any new prohibited activities out of the Zone A.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. Work to better manage stormwater by pre-treating contaminated stormwater and/or redirecting stormwater outside of the Zone A and Emergency Planning Zone.

✓ Continue your efforts to protect these areas and to monitor and review activities within the Zone A and Emergency Planning Zone.

2. Chemical and Hazardous Materials Manufacture, Storage and Use – Many large and small businesses use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in Underground Storage Tanks (USTs) and Aboveground Storage Tanks (ASTs). Although many facilities within the watershed use best management practices (BMPs), hazardous materials and waste can be unexpectedly released through spills, leaks or improper handling or storage, and become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

Work with communities within the combined watersheds to:

- ✓ Educate local businesses on BMPs for protecting water supplies, and encourage them to use BMPs for handling, storing and disposing of hazardous waste. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure "Industrial Floor Drains" for more information.
- ✓ Continue monitoring water quality in the Ipswich River.
- ✓ Continue to plan and prepare for spills by communicating with municipalities and facilities in the Ipswich River watershed, and by conducting drills.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

3. Agricultural Activities – Agricultural land uses (cropland, landscape operations, and nurseries) comprise about 7% of the combined watersheds. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, underground and aboveground storage tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills. Agricultural activities can also be a potential source of microbial contamination from improper manure management.

Agricultural Recommendations:

Work with communities within the combined watersheds to:

- ✓ Work with farmers to make them aware of the water supply and to encourage the use of a U.S. Natural Resources Conservation Service (NRCS) farm plan to protect water supplies.
- ✓ The Massachusetts Department of Food & Agriculture's booklet titled "On-Farm Strategies to Protect Water Quality - An Assessment & Planning Tool for Best Management Practices" (December 1996) describes technical and financial assistance programs related to the control of erosion and to the management of nutrients, pests, manure, grazing and irrigation.
- ✓ Work with farmers, nurseries and landscapers to ensure that pesticides, fertilizers and manure are being stored within a structure designed to prevent runoff.

(Continued on page 8)

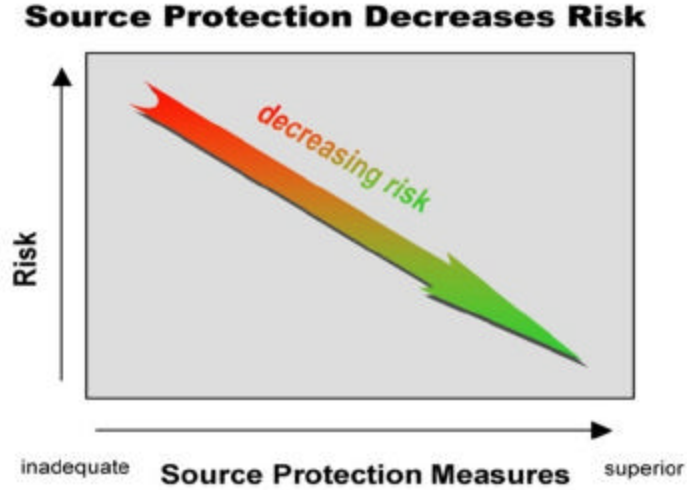


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity Zone C	Threat	Zone C Source ID #	Quantity Ipswich River Watershed	Potential Contaminant Sources*
Agricultural					
Dairy Farms	--	M	--	1	Improper handling of manure (microbial contaminants)
Fertilizer Storage or Use	2	M	01S, 03S	Few	Leaks, spills, improper handling, or over-application of fertilizers
Landscaping	--	M	--	1	Leaks, spills, improper handling, or over-application of fertilizers and pesticides
Manure Storage or Spreading	1	H	01S	Few	Improper handling of manure (microbial contaminants)
Nurseries	2	M	02S	Few	Leaks, spills, improper handling, or over-application of fertilizers, pesticides, and other chemicals
Pesticide Storage or Use	2	H	01S, 02S	Few	Leaks, spills, improper handling, or over-application of pesticides
Commercial					
Airports	1	H	01S	--	Spills, leaks, or improper handling of fuels, de-icers, salt, and other hazardous chemicals
Body Shops	--	H	--	9	Improper management of vehicle paints, solvents, and primer products
Gas Stations	2	H	01S	31	Spills, leaks, or improper handling or storage of automotive fluids and fuels
Service Stations/ Auto Repair Shops	1	H	01S	39	Spills, leaks, or improper handling of automotive fluids and solvents
Bus and Truck Terminals	--	H	--	6	Spills, leaks, or improper handling of fuels and maintenance chemicals
Cemeteries	1	M	01S	Several	Leaks, spills, improper handling, or over-application of pesticides; historic embalming fluids
Dry Cleaners	--	H	--	7	Spills, leaks, or improper handling of solvents and wastes
Golf Courses	1	M	02S	3	Over-application or improper handling of fertilizers or pesticides
Medical Facilities	--	M	--	2	Spills, leaks, or improper handling or storage of biological, chemical, and radioactive wastes

Land Uses	Quantity Zone C	Threat	Zone C Source ID #	Quantity Ipswich River Watershed	Potential Contaminant Sources*
Commercial					
Nursing Homes	--	L	--	2	Microbial contaminants
Photo Processors	--	H	--	3	Spills, leaks, or improper handling or storage of photographic chemicals
Printer and Blueprint Shops	1	M	01S	8	Spills, leaks, or improper handling or storage of printing inks and chemicals
Repair Shops (Engine, Appliances, Etc.)	--	H	--	5	Spills, leaks, or improper handling or storage of engine fluids, lubricants, and solvents
Sand and Gravel Mining/ Washing	--	M	--	3	Spills or leaks from heavy equipment, fuel storage, clandestine dumping
Industrial					
Asphalt, Coal Tar, and Concrete Plants	--	M	--	2	Spills, leaks, or improper handling or storage of hazardous chemicals and wastes
Hazardous Materials Storage	--	H	--	8	Spills, leaks, or improper handling or storage of hazardous materials
Machine/Metalworking Shops	--	H	--	8	Spills, leaks, or improper handling of sol-vents; metal tailings
RCRA TSDF Facilities	--	H	--	1	Spills, leaks, or improper handling or storage of hazardous wastes
Residential					
Fuel Oil Storage (at residences)	100+	M	01S, 02S, 03S	100+	Spills, leaks, or improper handling of fuel oil
Lawn Care/Gardening	100+	M	01S, 02S, 03S	100+	Over-application or improper storage and disposal of pesticides
Septic Systems/ Cesspools	100+	M	01S, 02S, 03S	100+	Microbial contaminants, and improper disposal of hazardous chemicals
Miscellaneous					
Aboveground Storage Tanks	3	M	01S	11	Spills, leaks, or improper handling of materials stored in tanks
Aquatic Wildlife	100+	L	01S, 02S, 03S	100+	Microbial contaminants
Composting Facilities	1	L	01S	--	Storage and improper handling of organic material, animal waste, and runoff
Fire Training Facilities	1	M	01S	--	Improper use or storage of fuels and other chemicals
Large Quantity Hazardous Waste Generators	--	H	--	14	Spills, leaks, or improper handling or storage of hazardous materials and waste
Landfills and Dumps	1	H	01S	2	Seepage of leachate

Land Uses	Quantity Zone C's	Threat	Zone C Source ID #	Quantity Ipswich River Watershed	Potential Contaminant Sources*
Miscellaneous					
Military Facilities (Past And Present) Type: former NIKE Sites	2	H	01S, 03S	--	Spills, leaks, or improper handling or storage of pesticides and herbicides, fuel, chemicals and other materials; may include ordnance or waste landfill/dump sites
NPDES Locations	1	L	01S	2	Improper disposal of hazardous material and wastes
Oil or Hazardous Material Sites	4	--	01S	57	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road and Maintenance Depots	1	M	02S	6	Spills, leaks, or improper handling or storage of deicing materials, automotive fluids, fuel storage, and other chemicals
Schools, Colleges, and Universities	1	M	02S	4	Spills, leaks, or improper handling or storage of fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small Quantity Hazardous Waste Generators	2	M	01S, 02S	56	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains	1/100+	L	01S/02S	100+	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	3	M	01S, 02S, 03S	Several	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	20	H	01S, 02S	191	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generators	4	L	01S, 02S	125	Spills, leaks, or improper handling or storage of hazardous materials and waste
Waste Transfer/ Recycling Stations	--	M	--	3	Improper management, seepage, and runoff of water contacting waste materials
Wastewater Treatment Plant/Collection Facility/ Lagoons	--	M	--	1	Improper handling or storage of treatment chemicals or equipment maintenance materials; improper management of wastewater
Water Treatment Sludge Lagoons	1	M	01S	1	Improper management of sludge and wastewater

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

*** THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

4. Residential Land Uses – Approximately 80% of the combined watersheds consist of residential areas, of which a large portion is served by private septic systems, with the remainder being served by municipal sewering. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

Work with communities within the combined watersheds to:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

5. Transportation Corridors - Several major transportation corridors and other paved and unpaved local roads cross through the watersheds. Spills from vehicular accidents are a major concern. In addition, roadway construction, maintenance, and typical highway use can all be potential sources of contamination.

Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins. The steep topography of the watershed results in application of de-icing materials to protect public health and safety by keeping the roads passable.

Transportation Corridor Recommendations:

Work with communities within the combined watersheds to:

- ✓ Identify stormwater drains and the drainage system along transportation corridors.
- ✓ Work with the Towns and State to have catch basins inspected, maintained, and cleaned on a regular schedule.
- ✓ Work with local emergency response teams to ensure that any spills can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

- ✓ Establish vegetated buffers along roads and parking areas to provide some filtration of contaminants.
- ✓ Encourage regular street sweeping. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water*.
- ✓ Conduct emergency drills to be ready for spills.
- ✓ Regularly inspect the watersheds for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills can be effectively contained.
- ✓ Work with the Massachusetts Highway Department to erect a suitable barrier on the portion of Route 1A that is adjacent to Wenham Lake.

6. Road and Maintenance Depots - Potential sources of contamination in state and municipal facilities can result from accidental dumping, spills, leaks, vehicle washing operations, or from wastewater treatment. Waste management and product storage pose the greatest threats with a wide variety of potentially harmful contaminants.

Road and Maintenance Depots Recommendations:

Work with communities within the combined watersheds to:

- ✓ Institute **Best Management Practices** - The New England Environmental Assistance Team provides municipalities in New England with information on how to comply with environmental requirements, and how to prevent pollution. For more information about this EPA sponsored program visit their website at http://www.epa.gov/region1/steward/neeat/muni/index.html. Encourage road and maintenance depots to develop best management practices to insure proper salt storage, proper maintenance of facilities and good housekeeping practices.
- ✓ Adequately size salt pile structure to allow for the loading and unloading of salt within the structure. Review the Department of Environmental Protection's Drinking Water Program Guidelines On Deicing Chemical (Road Salt) Storage at http://www.state.ma.us/dep/brp/dws/files/saltgui.doc.
- ✓ Encourage proper storage of materials at these facilities. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water.*

7. Presence of Oil or Hazardous Material Contamination Sites – The watersheds for Salem/Beverly and the Ipswich River contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 3-0000230, 3-0000231, 3-0000235, 3-0003597, 3-0000008, 3-0001813, 3-0014088, 3-0011228, 3-0003711, 3-0014696, 3-0017065, 3-0019416, 3-0000168, 3-0001494, 3-0001505, 3-0001941, 3-0004485, 3-0006026, 3-0010212, 3-0014402, 3-0015046, 3-0016824, 3-0018425, 3-0000692, 3-0002363, 3-0002584, 3-0002804, 3-0004007, 3-0004481, 3-0004583, 3-0017390, 3-0001565, 3-0006062, 3-0012406, 3-0014805, 3-0018398, 3-0019352, 3-0013565, 3-0004670, 3-0018082, 3-0000471, 3-0000518, 3-0000625, 3-0000776, 3-0001268, 3-0001728, 3-0001916, 3-0001973, 3-0002889, 3-0003548, 3-0003766, 3-0004022, 3-0004170, 3-0012586, 3-0013922, 3-0014811, 3-0014814, 3-0015247, 3-0017097, 3-0019380 and 3-0019651. Refer to the attached map and Appendix 3 for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

8. Protection Planning – Protection planning protects drinking water by managing the land area that supplies water to a reservoir. Currently, the City of Beverly has a Watershed Protection Overlay District Zoning Ordinance that was adopted in 1990; however, the watershed towns do not have water supply protection controls that meet DEP's Surface Water Protection regulations 310 CMR 22.20 (b) and (c). A Surface Water Supply Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply reservoirs.

Protection Planning Recommendations:

Work with communities within the combined watersheds to:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to http://mass.gov/dep/brp/dws/protect.htm for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Encourage watershed towns to adopt controls that meet 310 CMR 22.20 (b) and (c). For more information on DEP land use controls see http://mass.gov/dep/brp/dws/protect.htm.

Top 5 Reasons to Develop a Local Surface Water Protection Plan

❶ Reduces Risk to Human Health

❷ Cost Effective! Reduces or Eliminates Costs Associated With:

- Increased monitoring and treatment
- Water supply clean up and remediation
- Replacing a water supply
- Purchasing water

❸ Supports municipal bylaws, making them less likely to be challenged

❹ Ensures clean drinking water supplies for future generations

❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	**YES** (Putnamville Reservoir)	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. To the extent possible, remove prohibited activities in Zone A to comply with DEP's Zone A requirements.
	NO (Wenham Lake, Longham Reservoir)	
Is the Zone A/ Emergency Planning Zone posted with "Public Drinking Water Supply" Signs?	**YES**	The Emergency Planning Zone for the Ipswich River Watershed is not posted Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	**YES**	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	**YES** (Wenham Lake, Longham Reservoir)	Continue monitoring for non-water supply activities in Zone As.
	NO (Putnamville Reservoir)	Monitor prohibited activities in Zone A, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20B and 22.20C?	**NO**	Work with the Planning Board and the Beverly City Council to compare land use controls to see that they meet current requirements of 310 CMR 22.20 (B) and 310 CMR 22.20 (C). Refer to mass.gov/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	**NO**	Work with the Towns of Danvers, Topsfield and Wenham to include Salem/Beverly watersheds in their protection controls.
Planning		
Does the PWS have a local surface water protection plan?	**NO**	Develop a surface water supply protection plan. Follow "Developing a Local Surface Water Supply Protection Plan" available at: www.state.ma.us/dep/brp/dws/.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	**YES**	Supplement plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	**NO**	Establish a committee with representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	**YES**	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide watershed protection education?	**SOME**	Currently, outreach is through the annual Consumer Confidence Report. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial and municipal uses within the Zone C.

- ✓ Continue to work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the towns, see the Executive Office of Environmental Affairs' community preservation web site, http://commpres.env.state.ma.us/.

Other land uses and activities within the Protection areas that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Section 3: Emergency Planning Recommendations for Class B River Intakes

Prevention

Public water suppliers with a river source may take preventive measures to protect the source from unexpected releases. Here are some suggestions.

1. Title III (Emergency Planning and Community Right-to-Know) of the Superfund Amendments & Reauthorization Act (SARA) of 1986 required that each community **develop a comprehensive emergency response plan**. Suppliers should review the existing plan to ensure that water supply issues are satisfactorily addressed in the plan, that current response personnel and their correct telephone numbers are listed, and that the entire plan is regularly reviewed and updated by community officials.

   The community plan, or a separate water supplier plan, should include copies of policies in the event of spills or releases; regulatory notification requirements such as what size spills are required to be reported, who to call, telephone numbers, and what information is required to be reported; map of intakes, tributaries, watershed boundaries, adjacent public wells, and locations of sites where spills or accidental releases could occur.

2. **Identify, map and distribute information** to local emergency responders regarding the locations of intakes on the river, tributaries, watershed boundaries, public wells adjacent to river; chemical use at municipal, state, and industrial facilities in the watersheds (contact Fire Dept., DEP); locations of stormwater drains and the locations of known dams in the event that they can be manipulated by authorized individuals for contaminant control.

   The Fire Dept., Board of Health, Planning Board, Local Emergency Planning Committee (LEPC), DEP and others may have existing information to help with your work. SARA requires companies to work with the community's LEPC if they handle extremely hazardous chemicals in quantities above established thresholds.

3. **Develop a communication list** of contacts at upstream and downstream facilities, dams, as well as other public water suppliers on, or adjacent to, rivers. Notify owners and operators of these facilities about the location of your intake and request, in writing, that you be notified immediately in the event of a chemical spill or unexpected discharge. Take this opportunity to educate others about water supply protection.

4. **Provide comments** to municipal boards in other cities/towns in the watershed about proposed development, land use controls, Best Management Practices (BMPs) for stormwater flow into tributaries, and other issues to avoid future problems.

5. **Post signs** along major roads in watershed which direct the public to call "911" or other appropriate local number in case of spills. Be aware of accident-prone areas and transport routes of chemicals if possible.

6. **Educate** the public, local officials, Civil Defense, local emergency response team, and others about water supply protection issues. Educate businesses about toxic use reduction.

7. **Conduct household hazardous waste collection days** and establish permanent collection sites, away from sensitive watershed areas, for used batteries, paints, motor oil, etc.

8. **Conduct drills**, in coordination with local/regional response teams, to test policies and procedures and to practice responding to various situations. Including businesses, local officials and staff, Fire Departments, Boards of Health, Civil Defense, school administration, and others in planning and implementing the drills will allow for several town or region-wide concerns to be addressed and tested at the same time, including: issuing health advisories, conducting neighborhood and/or school evacuations, and evaluating the town's communication system (both making responders aware of the emergency and issuing advisories to the public when necessary via television, radio, and other news media), equipment and emergency plan in general.

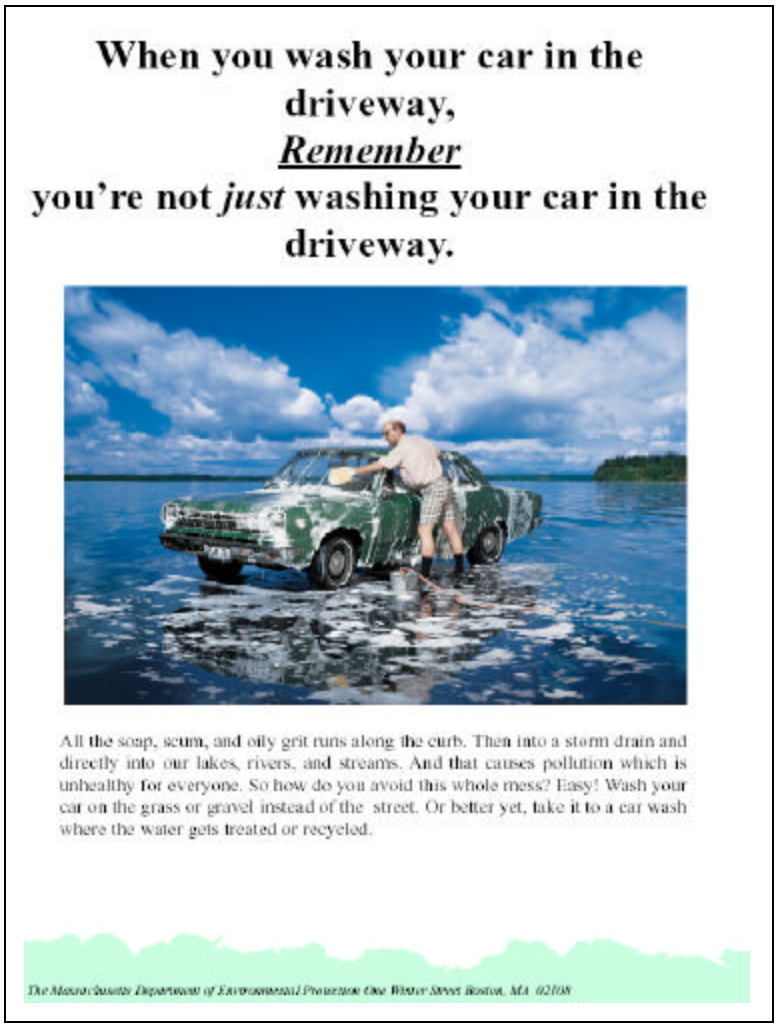
9. Critique the drills and **modify components** of the emergency response system as needed.

Responding to Emergencies

Drinking water supply professionals responding to local emergencies need to be adequately prepared and trained, and know their roles and responsibilities. Here are some suggestions.

1. **Know regulatory reporting requirements** of state and federal agencies. Know who to call, telephone numbers and what information to report.

2. **Know your role & responsibilities**. Have access to, and be familiar with, the emergency communication list, policies and procedures for emergency response; know when, and how, to safely handle spills or other events until first responders arrive on scene; know what steps to take to avoid drawing contaminants into the water supply system; be familiar enough with local watershed characteristics to provide incident commander with information and advice.



3. **Provide training and materials to responding staff**. Water supply staff, including new employees, should be adequately trained, have access to appropriate materials (storm drain covers, absorbent pads, booms, etc.), up-to-date policies, procedures, and communication lists to perform tasks for which they are responsible.

Follow-up

Steps can be taken to ensure better preparedness in the event of future emergency situations. Here are some suggestions.

1. **Provide follow-up reports** to the public on the resolution of the situation.

2. **Share** the **information** learned from drills and real situations with others in order to better protect all public drinking water sources.

Section 4: Source Water Protection Conclusions and Recommendations

As with many water supply protection areas, the system watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

Current Land Uses and Source Protection:
As with many water supply protection areas, the system watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The review of development plans in the City of Beverly and the Town of Wenham
- Conducting monthly stream monitoring throughout the watersheds that includes routine chemistry and microbiology
- Managing geese on Wenham Lake by keeping reservoir levels high during summer months

Source Protection Recommendations:
To better protect the sources for the future:

- ✓ Develop and implement a Surface Water Supply Protection Plan.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in watersheds and to cooperate on responding to spills or accidents.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or hazardous materials contamination site.
- ✓ Work cooperatively with Boards of Health to develop an inventory of septic systems in Hamilton, Topsfield, and Wenham.
- ✓ Work with businesses and others who have landscaped areas in the watersheds to encourage BMPs for the use of fertilizer and pesticide.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Continue to inspect the Zone A areas regularly, and when feasible, remove prohibited non-water supply activities.

Conclusions:
These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects.
Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: http://mass.gov/dep/brp/mf/mfpubs.htm.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the watersheds. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 5: Appendices

A. Protection Recommendations
B. Regulated Facilities within the Water Supply Protection Area
C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
D. Additional Documents on Source Protection

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.